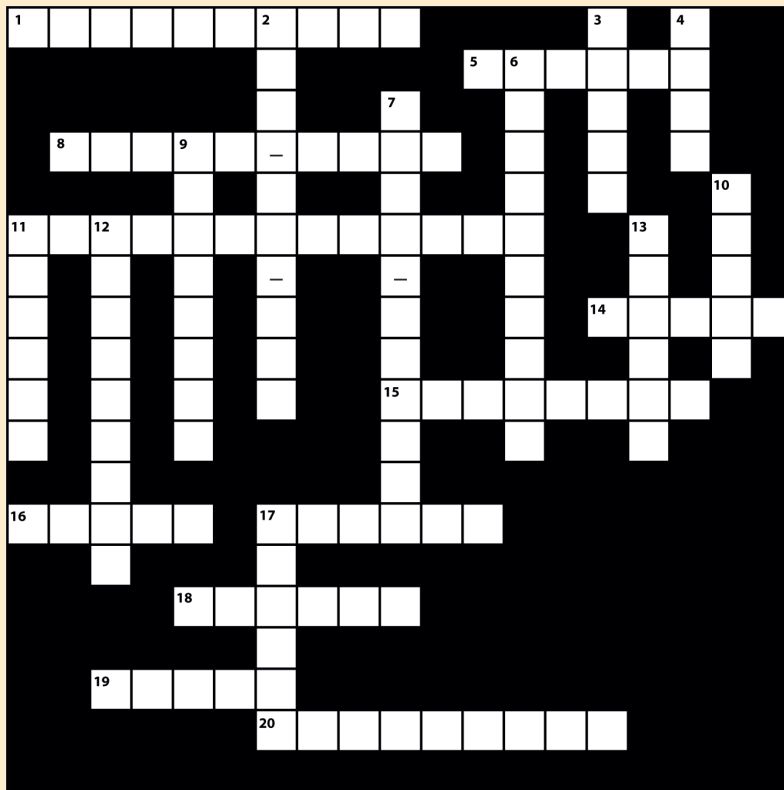


Take the HVAC CHALLENGE™

BY STEVEN G. LIESCHEIDT, P.E., CSI-CCS, CCPR

Applied Heat Pump And Heat Recovery



7. The Rankine Cycle is useful where large quantities of heat are wasted and energy costs are high.
9. This is the difference between the water temperature leaving the cooler and the wet-bulb temperature of the outside air.
10. This technology is an energy analysis tool that uses vector analysis to evaluate all heating and cooling utilities in a process.
11. This type of vane compressor can be used for the low stage of a multistage plant and has a high capacity but is generally limited to lower pressure ratios.
12. This type of tube can pass refrigerant at an excessive rate at low back pressures, causing liquid flood back to the compressors.
13. This organization sponsored Research Project RP-807, which produces guidelines for evaluating environmental benefits of heat recovery heat pumps.
17. One method proposed for increasing heating output at low temperatures is using this type of compression method.

To brush up on the facts behind this month's clues, refer to Chapter 8 ("Applied Heat Pump and Heat Recovery") in the *2004 ASHRAE Handbook - Systems & Equipment*.



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ACROSS

1. This type of heat pump uses sanitary waste heat or laundry waste heat as a heat source.
5. This type of compressor is a type of orbital motion positive-displacement compressor with low noise and vibration levels.
8. This is the outdoor temperature at which total heat losses from conditioned spaces equal internally generated heat gains.
11. This type of compressor is the most common for 0.5- to 100-ton heat pump systems.
14. When separate metering devices are used for two heat exchangers, this type of valve allows refrigerant to bypass the metering device of the heat exchanger serving the condenser.
15. This type of heat pump uses the high internal cooling load generated in modern buildings either directly or with storage.
16. This type of compressor offers high pressure ratios at low to high capacities.
17. In ground source heat pumps, horizontal systems can use coiled loops using these types of coils.
18. This is the temperature or range of tem-

peratures at which heat energy can be absorbed, rejected, or stored for use within the system.

19. This is the heat rejected from the building because its temperature is too low for economical recovery or direct use.
20. This is the maximum instantaneous cooling load of the building divided by the installed cooling capacity.

DOWN

2. This type of heat pump is the most common and is particularly suitable for factory-built unitary heat pumps.
3. This type of assisted heat pump relies on low-temperature energy from the sun as the heat source.
4. This type of heat pump system combines load transfer characteristics with multiple water-to-air heat pump units.
6. This is the outdoor temperature the designer selects as the point of switching over from cooling to heating by the HVAC system.

Can't wait until next issue?

Then check out the answers for this month's "HVAC Challenge" online as well as past puzzles at www.esmagazine.com.

Solution to February's HVAC Challenge™

